Editor's Note: This study compares demographic characteristics of online students compared to the national population of K-12 students in the United States. This data will be especially valuable to policy makers, funding agencies, and groups intent on equalizing learning opportunities for minority students.

Understanding online K-12 students through a demographic study

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Abstract

Online K-12 learning opportunities have proliferated, but much remains to be understood about the characteristics of participating students. This study presents a demographic profile of full-time, K-12 online learners today and compares them with public school students nationwide in the United States. The data was collected from a parent survey that produced 119,155 valid responses/records for students enrolled full-time in online K-12 public schools in 43 states. The study shows that the online student population includes somewhat more females than males, and more middle school than elementary or high school students. White students are overrepresented among full-time online learners compared with their share of the nationwide student population, while Hispanic/Latino and Asian/Pacific Islander students are underrepresented. Gifted and talented students and English language learners (ELLs) are also underrepresented. These data provide a baseline for more detailed explorations and can assist practitioners, policy makers, and researchers in making important decisions about online education that have implications for all students.

Keywords: K-12, online, distance, learning, education, demographics, gender, grade, race, ethnicity, socioeconomic status, gifted, talented, English-language learners, special education

Introduction

Enrollments in K-12 courses offered via distance education have grown remarkably. In 2003 in the United States, 317,070 public school students were enrolled in technology-based distance education courses in grades K-12 (Zandberg and Greene, 2008). By 2010, that number had increased to 1,816,390 students (U.S. Department of Education 2011). During this same period of 2003-2010, the percentage of K-12 school districts enrolling distance education students grew from 36% to 55%.

Research into this fairly new method of instructional delivery is in its earliest stages (Barbour 2013). This study seeks to expand our understanding of K-12 online students by collecting, aggregating, analyzing, and reporting data about their demographic characteristics. The demographic characteristics of online students are then compared with those of the K-12 public school student population nationwide, using data from the U.S. Department of Education (2012; 2013). The end result of this study is to better understand answer the question of "Who are the current online K-12 learners?" and thus give researchers and practitioners additional information when making decisions relating to these learners and their learning opportunities. Without a solid understanding of who the learners are, it is difficult to make sound decisions affecting the online learners of today and the future.

Demographic data can be particularly useful for helping practitioners, researchers, and policy makers make proactive decisions about learning initiatives, projects, curriculum, and policy affecting K-12 online students. For example, a study published by the U.S. Department of Education reports that public school districts across the nation actively collect and electronically

maintain demographic data about students. Many school districts use this demographic information to inform data-driven decisions about effective instruction, student placement, program evaluation, principal and teacher evaluation, and teacher professional development (Means, Padilla, and Gallagher 2010).

In a similar vein, the demographic profile of today's K-12 online students emerging from this study can assist researchers and practitioners in interpreting test results and informing customized projects, initiatives, and curriculum. This information can also help innovators achieve the goal of improving education for all learners.

Methods

Participants and procedures

Previous research studies that reported demographic data about online learners have relied on data collected by online/paper surveys or interviews (Ashong and Commander 2012; Glick 2011; Yee 2006). These techniques can yield a rich set of information.

In the current study, a survey was administered online to parents when they enrolled their child in an online school. The questions in the survey instrument collected demographic information about the students being enrolled in online school. Records were examined for the validity and completeness of responses, and any incomplete records were removed. Additionally, records for students who were being enrolled to study part-time were removed. Any identifying information about the students was also removed, resulting in de-identified records for each student. The resulting dataset for the study included 119,155 valid records of students enrolled full-time in online public schools in 43 states.

In some cases, as described below, responses were combined to form a more meaningful measure. For example, the racial/ethnic groups used for this analysis were consolidated from 63 distinct groups into 6 groups, consistent with the categories used by the U.S. Department of Education (2013). These include White, Black, Hispanic/Latino, Asian/Pacific Islander, American Indian/Alaskan Native, and two or more races.

The study collected and analyzed data for seven major demographic characteristics of students: (1) gender, (2) grade level, (4) race/ethnicity, (5) socioeconomic status (SES) as indicated by eligibility for free or reduced-price school lunches, (6) participation in gifted and talented programs, (7) English language learner (ELL) status, and (8) participation in special education.

Results of K-12 online learners for these seven demographic variables were compared with estimates for the public school population as a whole from the U.S. Department of Education (2012; 2013).

Results

The results of the analysis are grouped below into relevant categories. Data on students' gender and grade level are presented first, followed by data on race/ethnicity, socioeconomic status, and participation in special programs (gifted and talented, services for English language learners, and special education).

Gender

Online students are slightly more likely to be female than male, as displayed in Figure 1. According to the data, 51.84% of the students in the online sample were female, and 48.16% were male. By contrast, 48.60% of all K-12 students nationwide are female, while 51.40% are male.

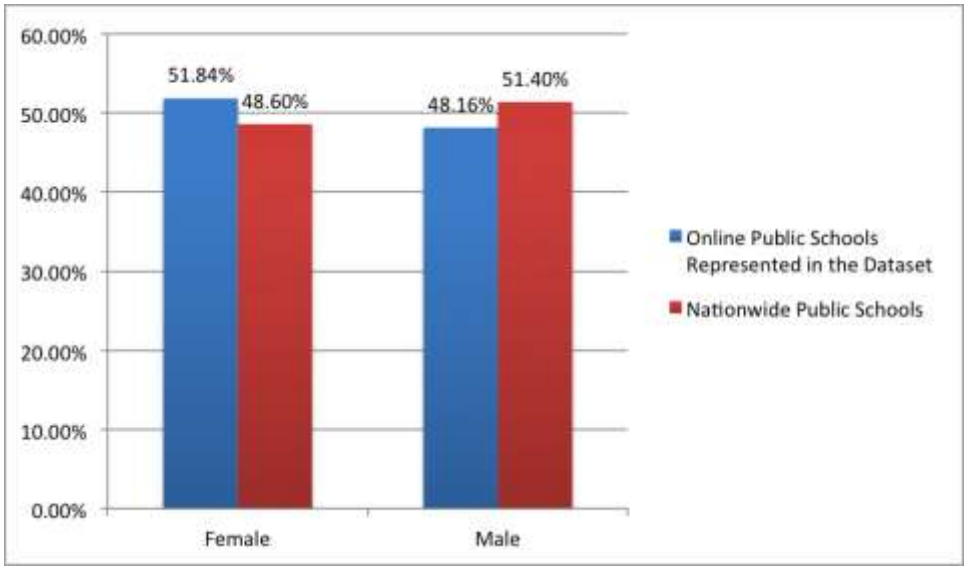

Figure 1. **Percentage of enrollment by gender for online students and public school students nationwide.**

Grade level

The highest percentages of online K-12 students are in grades 7 through 10. As shown in Figure 2, there are fewer online students in the elementary grades, but enrollments bulge during the middle school and then taper back off during high school.

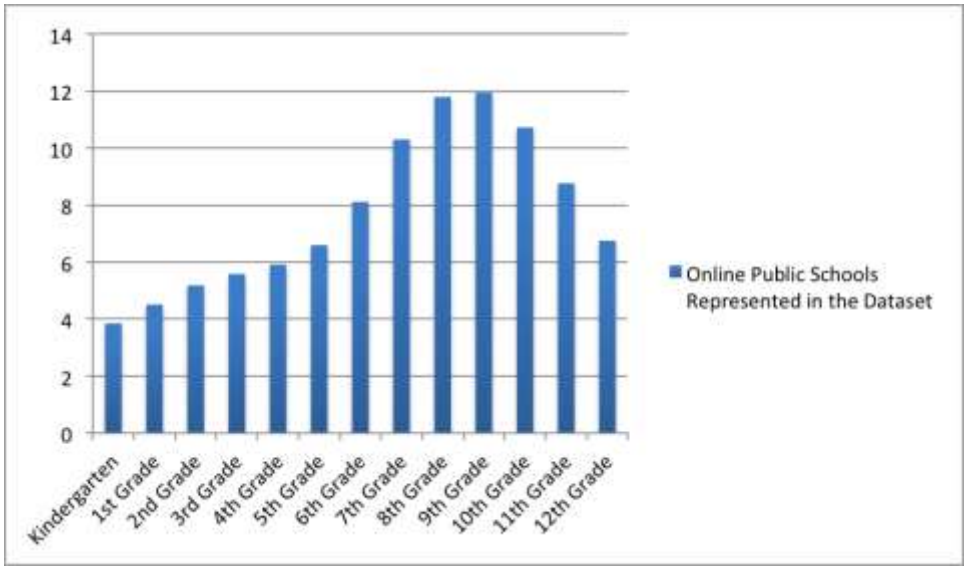

Figure 2. **Percentage distribution of online student enrollment by grade.**

Race/ethnicity

Figure 3 shows the race/ethnicity of online K-12 students. The vast majority (68.23%) of online students are White, while 15.82% are Black, 7.86% are Hispanic/Latino, 3.52% are Asian/Pacific Islander, and 1.59% are American Indian/Alaskan Native. The remaining students have two or more races/ethnicities (0.80%) or were reported as other/no response (2.19%). This "no response" group also includes students who reported a race/ethnicity that did not conform to the definitions set by the U.S. Department of Education (2013).

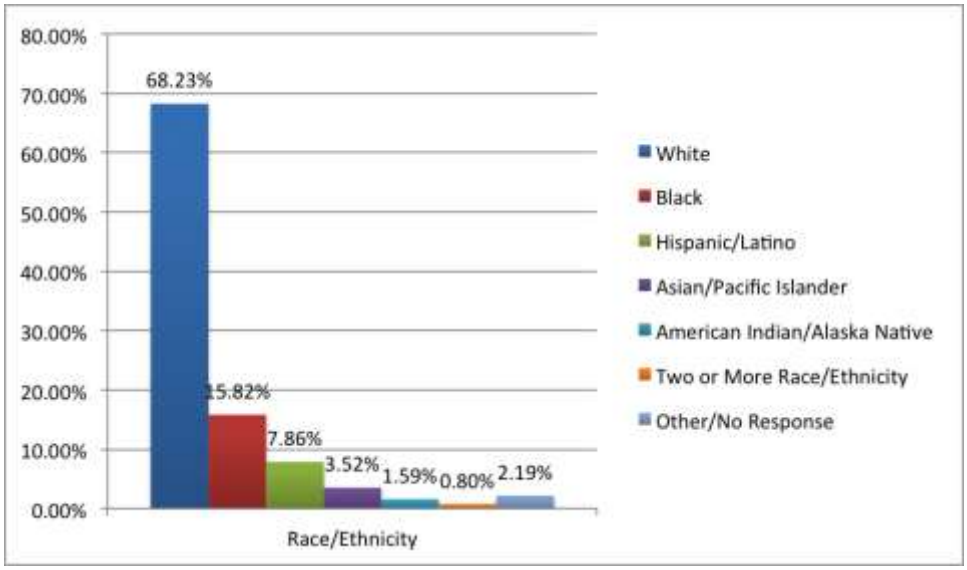

Figure 3. **Race/ethnicity of K-12 online students.**

Figure 4 compares the enrollment percentages of different racial/ethnic groups in online classes and in K-12 classes nationwide. The percentage of White students enrolled in online classes (68.23%) is much higher than the percentage of White students nationwide (51.7%). The percentages of online students who are Hispanic/Latino (7.86%) and Asian/Pacific Islander (3.52%) are much lower than their representation among students nationwide (23.7% and 5.1% respectively).

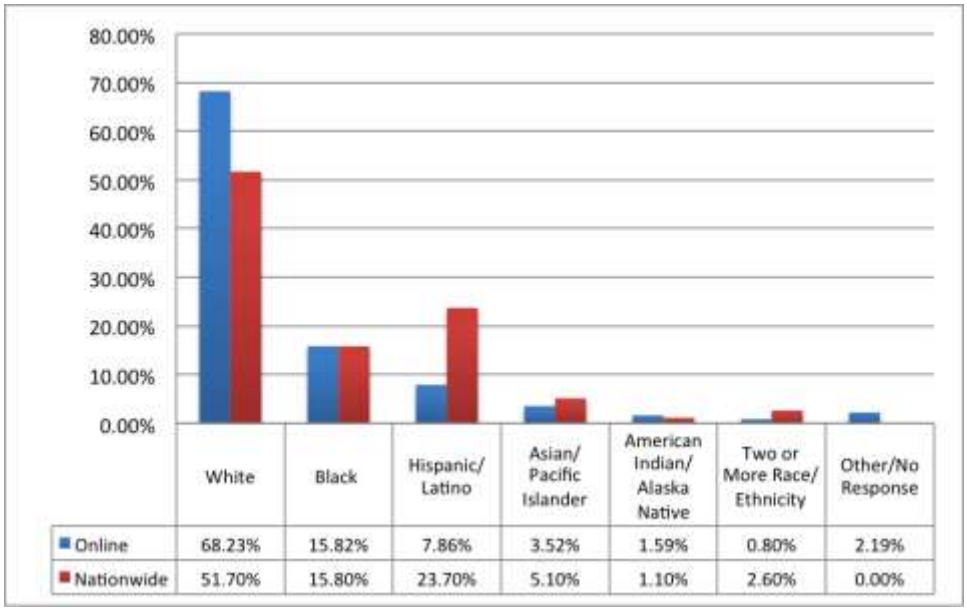

Figure 4. **Race/ethnicity of online students compared with students nationwide.**

Socioeconomic status

Socioeconomic status is often determined by a student's eligibility for free or reduced-price lunches through the National School Lunch Program (National Forum on Education Statistics 2006; Sirin 2005). As Figure 5 indicates, nearly half (49.15%) of online students in this dataset are eligible for free or reduced lunch, which is quite similar to the 49.6% of students who are

eligible nationwide. The remaining online students are either not eligible for free or reduced lunch or their eligibility is unknown.

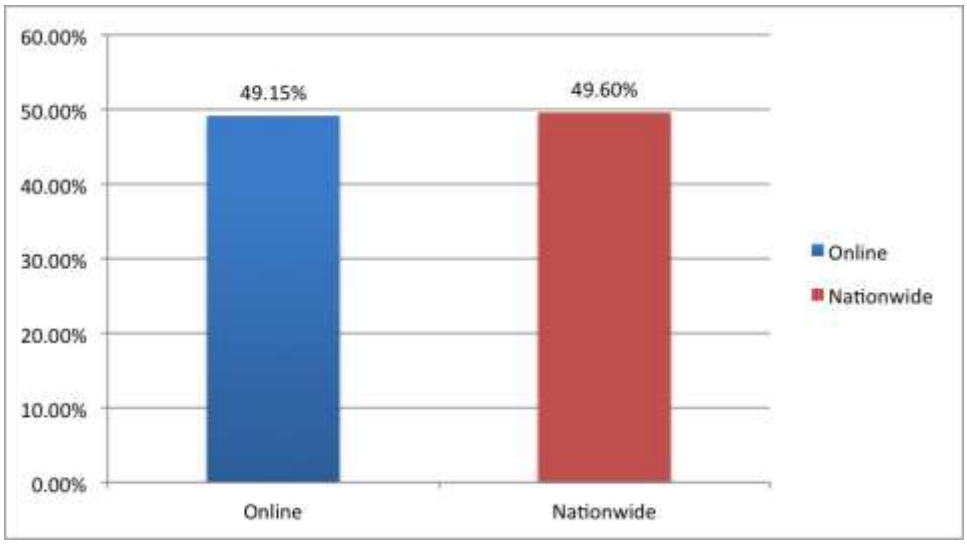

Figure 5. **Percentage eligible for free and reduced-price lunch among online students and public school students nationwide.**

Figure 6 shows the percentage of students eligible for free or reduced lunch by race/ethnicity for online students in the dataset. There are clear discrepancies between the percentages of the groups. The vast majority (63.38%) of the online students eligible for free or reduced lunch are White, while 20.82% are Black, 8.73% are Hispanic/Latino, 2.50% are Asian/Pacific Islander, and 1.92% are American Indian/Alaskan Native. The remaining students have two or more races/ethnicities (0.94%) or were reported as other/no response (1.71%).

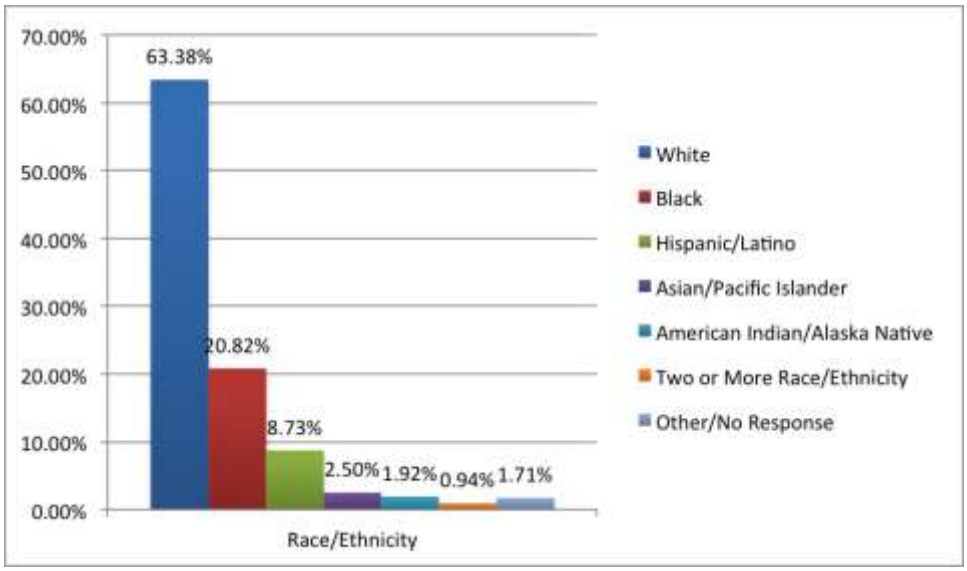

Figure 6. **Percentage of students eligible for free or reduced-price lunch by racial/ethnic group.**

Gifted and talented

As Figure 7 shows, 3.22% of online students are reported as participating in gifted and talented programs. This compares with 6.7% of students nationwide.

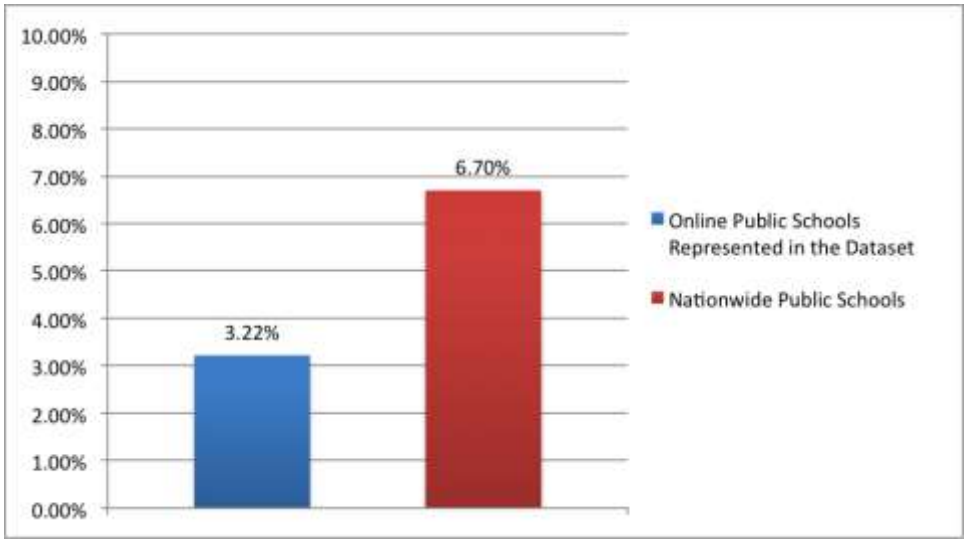

Figure 7. **Percentage of gifted and talented students online and nationwide.**

English language learners

As Figure 8 indicates, just 1.08% of the online students in the dataset are ELLs, which is much lower than that 9.8% of students nationwide who are ELLs.

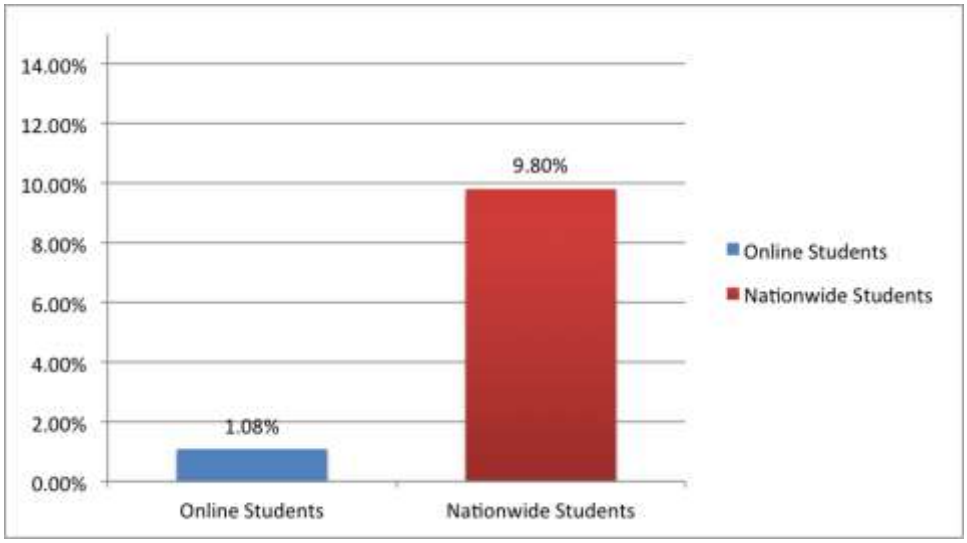

Figure 8. **Percentages of students online and nationwide who are English language learners.**

Special education students

According to parents' reports from the study survey, 13.30% of online K-12 students receive special education services. As shown in Figure 9, this is very similar to the 12.90% of students nationwide who receive special education services.

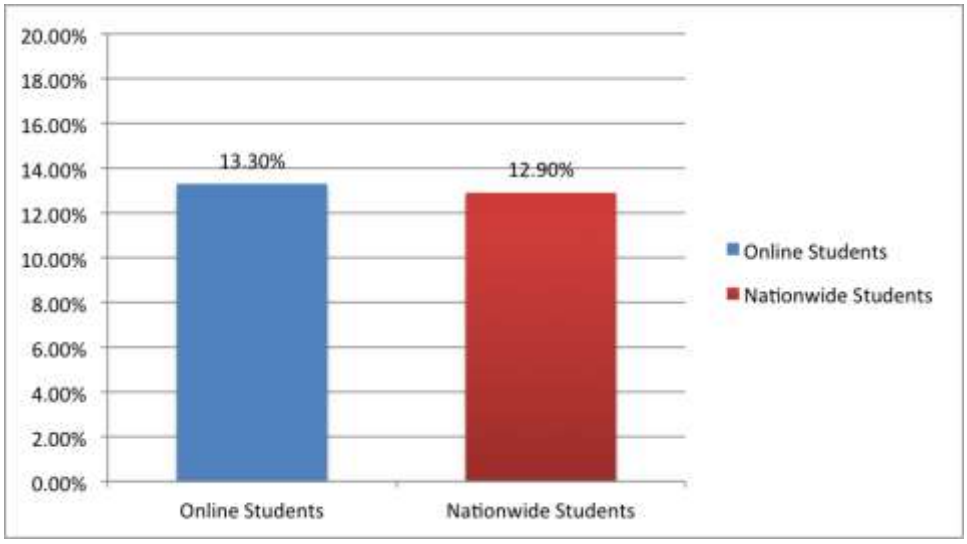

Figure 9. **Percentage of online students and students nationwide who participate in special education.**

Discussion

The purpose of this study was to develop a profile of the demographic characteristics of full-time, K-12 online learners and answer the question of "Who are the current online K-12 learners?" This is clearly the primary question to be answered by this research study. However, the findings of this research lead us to consider additional research questions for the future. In fact, this study will raise a significant number of important future research questions. At the current stage of growth for online K-12 learning, identifying these future research questions is very important to the healthy growth and understanding of the field. The demographic information from this study along with the identification of the future research questions will assist researchers moving forward and ultimately will impact policy makers, practitioners, and others in developing customized, innovative education solutions that could ultimately benefit all learners. While the data in this study represent a snapshot in time, the researchers intend to conduct the study on an annual basis so that future reports will include data on year-to-year trends. The discussion below reviews the findings from this study and introduces additional research questions that should be considered.

Gender and grade

Among the online K-12 students in this study, females slightly outnumbered males. This is the opposite in absolute value of the national data for all students, in which males slightly outnumber females. Why might more females be attracted to online learning than their male counterparts? Also, conversely, why might male students be less attracted to online learning? These are interesting questions to be considered and further research into adoption rates, satisfaction and success in online learning by gender may yield unique findings. Furthermore, studies of gender combined with achievement data may also show interesting results and should be pursed. This is of particular interest when examining the STEM areas of study for both genders of online learners.

Student grade level may offer another avenue for fruitful research. At the lower end of the spectrum, it is understandable why fewer students in the early elementary grades participate in online learning because younger students generally need more hands-on teacher support and are less technologically adept. However, the data in this study show student enrollments gradually increasing from grades K through 9, and then gradually decreasing from grades 9 through 12.

This finding leads to the question "Where do those 10th grade (and older) students go if they are not enrolled in online schools?" Do they return to traditional brick and mortar schools? Do they lose interest in online schooling? Could it have anything to do with shortages of specialized teachers to oversee high school level online courses (e.g., in more advanced science and math)? Is there something that attracts them back to a brick and mortar environment? Or do the online students have a higher dropout rate from schooling altogether than those in brick and mortar schools? While the current result may reflect where students in this study were enrolled, more research should be done to compare students in similar face-to-face schools and broken down by geographic regions. Anytime a national study is performed, it has the potential to miss more localized findings that could be significant.

Additional issues involving gender and grade that could be investigated include student social components, parent influence, cultural impacts and availability/skill with technology among the varying ages and grades of students.

Race and ethnicity

According to the results shown in Figure 3, an online student is more than twice as likely to be White as to be Black, Hispanic/Latino, Asian/Pacific Islander, Alaskan Native, or two or more races. As can be seen in the comparisons in Figure 4, White students are far more represented in the online schools in this dataset than in schools nationwide, and Hispanic/Latino and Asian/Pacific Islander students are far less represented. The underrepresentation of Hispanic/Latino students in online schools has been noted in other recent studies of the demographics of online students (Glick 2011; Molnar, et al. 2014). It is not yet known to what extent the distribution of online schools throughout the nation affects the results. For example, are states with lower populations of Hispanic/Latino students providing online K-12 schooling options? An analysis of this issue is greatly needed to answer this question and to consider other research question concerning "Why Hispanic/Latino and Asian/Pacific Islander students are underrepresented in online learning?" A rich area for further research would involve a comparison of online and face-to-face schools in similar regions. Additional questions about possible effects of culture, technology access and adoption, language, and other effects could be examined in future studies.

Socioeconomic status

In this study, socioeconomic status is determined by students' eligibility for free and reduced lunch. The study found (Figure 5) that the percentage of eligible online students is fairly similar to the nationwide percentage. However, when comparing the overall percentages of race/ethnicity of online students (Figure 3) to percentage of online students eligible for free or reduced lunch by racial/ethnic group (Figure 6), some interesting findings are observed. The percentage of White online students eligible for free or reduced lunch (63.38%) is somewhat lower than the overall percentage of White online students (68.23%). The percentage of online Black students eligible for free or reduced lunch (20.82%) is somewhat higher than the overall percentage of Black online students (15.82%). The percentage of Hispanic/Latino online students eligible for free or reduced lunch (8.73%) is slightly higher than the overall percentage of Hispanic/Latino online students (7.86%). The percentage of Asian/Pacific Islander online students eligible for free or reduced lunch (2.50%) is lower than the overall percentage of Asian/Pacific Islander online students (3.52%). The percentage of American Indian/Alaska Native online students eligible for free or reduced lunch (1.92%) is slightly higher than the overall percentage of American Indian/Alaska Native online students (1.59%).

Further research on the SES of online learners is warranted. One logical next step is to compare students against national and regional socio-economic data. Additionally, a comparison of free

and reduced lunch eligibility by grade and for English language learners, special education students, and gifted and talented students, might yield interesting and informative results.

Gifted and talented

The percentage of online gifted and talented students in the dataset is less than half the nationwide percentage of gifted and talented students (Figure 7). These findings are somewhat striking because gifted and talented students are often considered especially suited to online learning (Duke University Talent Identification Program 2011; Johns Hopkins Center for Talented Youth 2013; Wallace 2009). In fact, some experts suggest that the advanced cognitive skills of gifted and talented learners may naturally manifest in an affinity for and success with technology (Karnes and Siegle 2005), although this may not always be the case (Cope and Suppes 2002; Periathiruvadi and Ninn 2012; Siegle 2002).

This result must be taken with extra caution for two reasons. First, the data were collected from parents, who were asked whether their child had participated in programs for the gifted and talented; however, "gifted and talented" may not have been defined for the parent at the time the information was collected, and students in the lower grades (K-2) may not yet have been identified as gifted and talented. Consequently, the data may be underreported or over reported. Second, only the records of full-time online students were included in the analysis. Since gifted and talented students may use online learning to supplement the offerings of their home school (Barbour and Reeves 2009; O'Dwyer, Carey, and Kleiman 2007; Wallace 2009), they may be enrolled online as part-time students. This is especially true for students who live in rural areas or who desire to learn about a low-demand school subject. Therefore, some data about gifted/talented students may be missing, and additional investigation to confirm the results is needed.

With these cautions in mind, it is also possible that gifted and talented students may not be utilizing full-time online schools because they are already rewarded and prospering in face-to-face programs. All of these factors indicate a need for additional research about the use of online education by gifted and talented students.

English language learners

In this study, the percentage of English language learners enrolled in online classes is strikingly lower than the nationwide percentage (Figure 8). Many factors may have influenced this result, such as race/ethnicity differentials (see Figure 4), mastery of the English language, availability of appropriate curriculum, or the amount of support ELLs need to be successful in online education (Glick 2011; Molnar, et al. 2014). Still, questions remain.

One such question may be asked against the backdrop of the wide and successful use of technology in second language (L2) and foreign language learning, which has grown significantly since 1991 (Garrett 1991; Thorne, Black, and Sykes 2009). According to most researchers, language learning may be enhanced with the use of language and text-heavy technologies, such as chat rooms, internet discussion boards, and social media, where students can readily use and practice their second language. Even though this practice is not without criticism, the relatively successful combination of technology and second language learning, along with the underrepresentation of ELLs online uncovered by this and other recent demographic studies, may lead researchers to explore questions related to the effective use of online learning for K-12 ELL students.

Another question is whether ELLs, who have specialized learning needs, could benefit from increased access to online education because of the personalized and self-paced nature of online learning, which is highly desirable in today's education climate (as demonstrated in the *U. S. National Technology Plan* (2010) and the U.S. Department of Education's *Race to the Top* (2010;

2011; 2012) and *ConnectED* (2014) Initiatives). Accordingly, an ELL student could use online learning especially for language-heavy subjects that require time-consuming translation of the material. In the final analysis, further research into online learning by English language learners appears necessary in order to enact proactive education policies.

Special education

The percentage of online students identified as special education students by their parents is very similar to the nationwide percentage (Figure 9). This is a somewhat surprising result given that some of these students might require face-to-face hands on assistance from teachers and other specialists. Research into how this is achieved and examining outcome and success data for online special education students would be very interesting. Additional future research could disaggregate the data for online special education students by grade, gender, race/ethnicity, socioeconomic status, gifted and talented status, and ELL status. It would also be of interest for researchers to examine the different categories of special education disabilities and the level of services provided for online students.

Conclusions

This study has taken an important step toward advancing understanding of K-12 online learners by collecting, analyzing, and reporting the latest demographic information about current K-12 students enrolled full-time in online learning. The primary research question answered in this study is "Who are the current online K-12 learners?" However, the study also identified many important future research questions that should be answered to assist in better understanding this important area of K-12 learning. Future studies can build on the results of this study by digging more deeply into the effectiveness of online learning and best practices for online learners.

Findings from this type of research can be used for proactive, data-driven decision making. For example, the field of research on distance education and online learning will benefit from more granular data about K-12 online students with special statuses (special education students, gifted and talented students, English language learners, and students from low-SES families). Regional and local groupings of the data will help researchers better understand the localized implementations of online learning programs. Additional information about the interplay among the variables of region, gender, racial/ethnic identity, and special statuses will help researchers, policy makers, and teachers make better decisions about online learning and develop high-quality educational options for all students.

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